

A Multidisciplinary Approach to the Diagnosis and Management of Obstructive Sleep Apnea: Current Strategies and Future Directions

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Abstract: Obstructive Sleep Apnea (OSA) is a prevalent and underdiagnosed sleep disorder with significant public health implications, affecting nearly 1 billion people globally. Characterized by repeated episodes of upper airway obstruction during sleep, OSA is associated with excessive daytime sleepiness, cardiovascular morbidity, metabolic dysfunction, and impaired quality of life. Despite its high prevalence, a significant proportion of individuals with OSA remain undiagnosed and untreated. This article explores the current state of multidisciplinary approaches to the diagnosis and management of OSA. Emphasis is placed on the integration of otolaryngology, pulmonology, neurology, dentistry, sleep medicine, and behavioral health to achieve individualized and effective care. Recent advances in diagnostic technologies, therapeutic options including CPAP, oral appliance therapy, surgical interventions, and emerging future directions such as neurostimulation and precision medicine are discussed. The goal is to provide a comprehensive, evidence-based framework to improve clinical outcomes and enhance patient adherence.

Key points: Obstructive sleep apnea, multidisciplinary care, CPAP, oral appliance therapy, sleep surgery, neurostimulation, diagnosis, precision medicine, ENT, sleep disorders.

Introduction: Obstructive Sleep Apnea (OSA) is a chronic, progressive sleep-related breathing disorder marked by recurrent upper airway collapse during sleep, leading to intermittent hypoxia, arousals, and sleep fragmentation. The prevalence of OSA is rising due to aging populations and increasing rates of obesity. It affects individuals of all ages, but adult males and postmenopausal women are particularly vulnerable. OSA poses a substantial burden on healthcare systems, contributing to cardiovascular diseases, type 2 diabetes, neurocognitive dysfunction, and increased risk of accidents. Early diagnosis and effective treatment are critical, yet many patients remain undiagnosed due to lack of awareness, limited access to sleep studies, and overlapping symptoms with other conditions.

A multidisciplinary approach has emerged as the gold standard in OSA management, recognizing that effective care requires collaboration among various specialties. Otolaryngologists play a crucial role in anatomical assessment and surgical interventions; pulmonologists and sleep specialists focus on diagnosis and CPAP management; dentists provide oral appliance therapy; and behavioral therapists address adherence and lifestyle modifications. This collaborative model ensures holistic care and improved outcomes.

In this review, we examine the current strategies for diagnosing and managing OSA from a multidisciplinary perspective. We also explore future directions in personalized care, advanced diagnostics, and novel therapies that promise to revolutionize the field of sleep medicine.

Materials and Methods: This comprehensive review is based on an extensive literature search conducted across major medical databases, including PubMed, Scopus, and Web of Science. The inclusion criteria for article selection encompassed peer-reviewed clinical trials, meta-analyses, and systematic reviews published between 2000 and 2024. Articles were selected based on relevance to the diagnosis and management of OSA in adult populations, particularly emphasizing multidisciplinary interventions and emerging technologies. In total, 185 articles were included in the final synthesis. Additionally, expert consensus guidelines from the American Academy of Sleep Medicine (AASM), American Thoracic Society (ATS), and American Academy of Otolaryngology–Head and Neck Surgery (AAO-HNS) were reviewed to ensure the inclusion of evidence-based clinical recommendations.

Results: The multidisciplinary approach to OSA management demonstrates significant improvements in diagnostic accuracy, treatment efficacy, and patient satisfaction. Key findings include:

Diagnostic Advances:

Home Sleep Apnea Testing (HSAT) has increased accessibility to diagnosis, particularly for moderate-to-severe OSA.

Polysomnography remains the gold standard for comprehensive sleep evaluation.

The STOP-Bang and Epworth Sleepiness Scale (ESS) remain widely used as screening tools.

CPAP Therapy:

Continuous Positive Airway Pressure (CPAP) remains the first-line treatment for moderate-to-severe OSA.

CPAP adherence improves with behavioral therapy, mask fitting, and telemonitoring support.

Oral Appliance Therapy:

Mandibular advancement devices (MADs) are effective for mild-to-moderate OSA and CPAP-intolerant patients.

Dental sleep medicine plays an integral role in managing these patients.

Surgical Interventions:

Uvulopalatopharyngoplasty (UPPP), genioglossus advancement, and maxillomandibular advancement (MMA) are effective surgical options.

DISE (Drug-Induced Sleep Endoscopy) enhances surgical planning and outcome prediction.

Neuromodulation:

Hypoglossal nerve stimulation (HNS) is emerging as a promising alternative for select patients with moderate-to-severe OSA who are CPAP-intolerant.

Behavioral and Lifestyle Interventions:

Weight management, positional therapy, alcohol avoidance, and cognitive behavioral therapy (CBT) enhance outcomes.

Discussion: The integration of multiple disciplines in the management of OSA reflects the complexity of the disorder and the necessity of individualized care. The efficacy of CPAP is well established, yet long-term adherence remains a significant barrier. Oral appliances and surgical interventions offer alternatives, but patient selection and expertise are critical for success. The rise of HNS and wearable technologies reflects a shift toward personalized, patient-centered care.

Moreover, the role of behavioral health cannot be overstated. Adherence to therapy is deeply influenced by patient education, motivation, and psychosocial factors. Multidisciplinary clinics that include psychologists or sleep behavioral therapists have demonstrated superior outcomes in patient engagement and satisfaction.

Healthcare systems must adapt to support this model. Coordinated care pathways, shared electronic health records, and interdisciplinary sleep clinics are essential components of future care frameworks. Policymakers must recognize OSA as a chronic condition with wide-reaching implications and allocate resources accordingly.

Conclusion: Obstructive Sleep Apnea is a multifaceted disorder requiring comprehensive, multidisciplinary management. Advances in diagnostics, therapeutic options, and interdisciplinary collaboration have greatly improved patient outcomes. Future efforts should focus on expanding access, refining patient stratification, and integrating novel technologies such as AI-powered diagnostics and wearable sensors. By embracing a team-based approach, clinicians can more effectively address the physiological, behavioral, and lifestyle aspects of OSA, ultimately reducing the global burden of this underrecognized disorder.

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